Contribution of Robert Ellis to Inhaled Analgesia for Labor and Delivery

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Abstract: Simpson was the first to use chloroform for inhaled analgesia for labor and delivery, but its acceptance was limited by the political era until John Snow administered chloroform to Queen Victoria during the birth of Prince Leopold on April 7, 1853. The irrepressible monarch who had hitherto suffered long and arduous labors declared, "We're having the baby and we're having chloroform." With increased use of chloroform came increased incidence of complications. By 1863, 123 recorded deaths had been attributed to chloroform anesthesia in Europe. In response, the Royal Medical and Chirurgical Society formed a chloroform committee in 1864. Experimenting on dogs, the committee concluded chloroform, given at high percentage, resulted in cardiovascular collapse. The committee found ether exerted a very slight depressant effect on heart contractility. The committee recommended a combination of inhalation anesthetics be used to induce and maintain anesthesia in an effort to minimize the percentage of chloroform used. The committee’s findings were published in the Medical-Chirurgical’s Transactions in 1864.

John Gabb had previously tried mixing chloroform with ether as early as 1848 to minimize the amount of chloroform used. Unfortunately, ether, with a boiling point of 35°C evaporated more rapidly than chloroform resulting in a slow induction with copious secretion. Following this difficult induction, the cardiac depressant properties of chloroform became apparent. The ideal device to correct this problem would administer these two agents in sequence rather than as a mixture. Robert Ellis, an obstetric surgeon at the Chelsea and Belgrave dispensary, invented such a device in 1866. The Compound Inhaler was a device with two separate containers for anesthetics. (1) A turnstile device on top of the main canister permitted either or both agents to be delivered in a more controlled manner.

An elbow tube (Fig. 1) attached to the main canister took the vapors to a face piece through an air inlet valve. Although inhaled analgesia was introduced by Simpson and popularized by Snow, it was the invention of Robert Ellis’ Compound Inhaler that added safety to the delivery of labor analgesia. His entrepreneurial engineering is a landmark for obstetric anesthesia.

Figure 1 Courtesy of the Wood Library-Museum of Anesthesiology

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In the Wellcome Institute of the History of Medicine.